Amendments to the claims

1 (Original): An apparatus for use in rotational measurement, comprising:

a rotational assembly to rotate about a rotational axis;

at least two interferometers, each to receive a respective light beam, to separate said respective light beam into both a respective reference beam and a respective measuring beam, to direct said respective measuring beam to said rotational assembly, and to receive said respective measuring beam back from said rotational assembly;

said rotational assembly including a plurality of cube corners mounted such that at least one of said cube corners is able to receive from and reflect back to one said interferometer a respective said measuring beam as said rotational assembly rotates about said rotational axis; and

said interferometers each further to combine its said respective reference beam with its said respective measuring beam into a respective detection beam, wherein at least one said respective detection beam includes an interference signal; thereby permitting rotational measurement of said rotational assembly and any attached work piece target based on processing of said interference signal.

2 (Original): The apparatus of claim 1, wherein:

each said interferometer is mounted in a different plane, to direct its said respective measuring beam to said rotational assembly and to receive its said respective measuring beam back from said rotational assembly in that respective said plane; and

said rotational assembly has a sub-plurality of said plurality of cube corners mounted in each respective said plane to receive from and reflect back said respective measuring beam of the respective said interferometer in that respective said plane.

3 (Original): The apparatus of claim 1, wherein said interferometers are linear mode interferometers.

Amendments to the claims

4 (Original): The apparatus of claim 1, wherein said interferometers are differential mode interferometers.

5 (Currently amended). A method ~~of using a rotary assembly including multiple cube corner pairs and multiple laser beams of a laser interferometer or laser Doppler displacement sensor~~ to measure rotation in a full circle of a target object, ~~wherein the cube corners pairs are distributed evenly over the full circle so they cover overlapping angular ranges with each other, thereby preventing signal loss during change over between the cube corners~~ comprising:

placing a rotary assembly of multiple cube corner pairs distributed evenly over the full circle;

providing measuring and reference laser beams of a laser interferometer or laser doppler displacement sensor;

directing said measuring laser beams to at least one said cube corner pair such that at least said measuring laser beam is reflected;

combining said measuring laser beams that are reflected with said reference laser beams to obtain at least one detection beam including an interference signal; and

processing said interference signal to determine rotation of the target object.

6 (Currently amended). The method of claim 5, wherein the rotational center of the target object is known, ~~and the rotary assembly is mounted coaxial with the rotational center~~ the method further comprising:

mounting said rotary assembly coaxial with the rotational center, thereby permitting measurement in a linear mode to be used.

7 (Currently amended). The method of claim 5, wherein : ~~two laser beams generated by a differential interferometer are used concurrently to measure motions of two cube corners that are mounted in the rotary assembly, thereby permitting measurement in a differential mode to be used and for measurement to be performed regardless of whether the rotational center of the target object and the rotary assembly are coaxial~~

Amendments to the claims

said providing includes providing a first said measuring laser beam and a second said measuring laser beam; and

said combining includes differentially combining said first said measuring laser beam and said second said measuring laser beam, thereby permitting differential mode measurement regardless of whether the rotational center of the target object and said rotary assembly are coaxial.